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LETTER

Kumdykolite, a high-temperature feldspar from an enstatite chondrite

PÉTER NÉMETH,[1,2,*] STEPHEN W. LEHNER,[2,3] MICHAIL I. PETAEV,[4] AND PETER R. BUSECK[2,3]

[1]Institute of Materials and Environmental Chemistry, Research Center for Natural Sciences, Hungarian Academy of Sciences, H-1025 Budapest, Pusztaszeri út 59-67, Hungary
[2]School of Earth and Space Exploration, Arizona State University, Tempe, Arizona 85287-1404, U.S.A.
[3]Department of Chemistry and Biochemistry, Arizona State University, Tempe, Arizona 85287-1604, U.S.A.
[4]Department of Earth and Planetary Sciences, Harvard University, Solar, Stellar, and Planetary Sciences, Harvard-Smithsonian CfA, Cambridge, Massachusetts 02138, U.S.A.

ABSTRACT

We report the first occurrence of kumdykolite in a meteorite (Sahara 97072, EH3). This orthorhombic form of albite occurs in the core of a concentrically zoned metal-sulfide nodule. In contrast to the terrestrial kumdykolite, the meteoritic sample has a domain structure that is consistent with either orthorhombic (*Pmnn*) or monoclinic ($P2_1$) space groups. The two symmetries are indicated by the presence or lack, respectively, of $h + k = 2n + 1$ reflections in [001] selected-area electron diffraction patterns, effects that likely result from different Si-Al ordering. *Pmnn* kumdykolite has only one tetrahedral site for Si and Al, whereas $P2_1$ kumdykolite would have three tetrahedral sites for Si and one for Al. We propose that kumdykolite formed above 1300 K and cooled rapidly enough to preserve its unique structure. Apparently, the cooling rate varied on the scale of nanometers allowing the local development of Si-Al ordering.

Keywords: Kumdykolite, albite polymorph, enstatite chondrite, domain structure, Si-Al ordering